The Hidden Dimensions of Architecture and Engineering Design

A Panel Discussion Featuring Frank Gehry



The art of going from a notional vision of a system to a fully realizable design is called "architecting." For an architecture to be realizable over its lifetime, it has to conform to many demands. Not only does it need to conform to the vision and its ultimate purpose, it needs to adhere to a world of requirements: affordability, reliability, legality, operability, simplicity, analyzability, testability, understandability, accessibility, manufacturability, and repairability, among many others. Ultimately, the architectures that "hang together" in many or all of these dimensions evoke a sense of elegance and beauty. Please join us as Frank Gehry and JPLers Rob Manning and Raul Polit-Casillas discuss examples of design and architecture, and the importance of a well-thought-out design.



Rob Manning



JPL NASA/Caltech

"Have you ever thought that all of humanity's efforts, all the computations and calculations, all the nights spent over working drafts and blueprints, invariably culminate in the production of a thing whose sole and guiding principle is the ultimate principle of simplicity? It is as if there were a natural law which ordained that to achieve this end..., there must be the experimentation of several generations of craftsmen.

In anything at all, *perfection is finally attained not when there is no longer anything* to add, but when there is no longer anything to take away, when it has been stripped down to its nakedness.

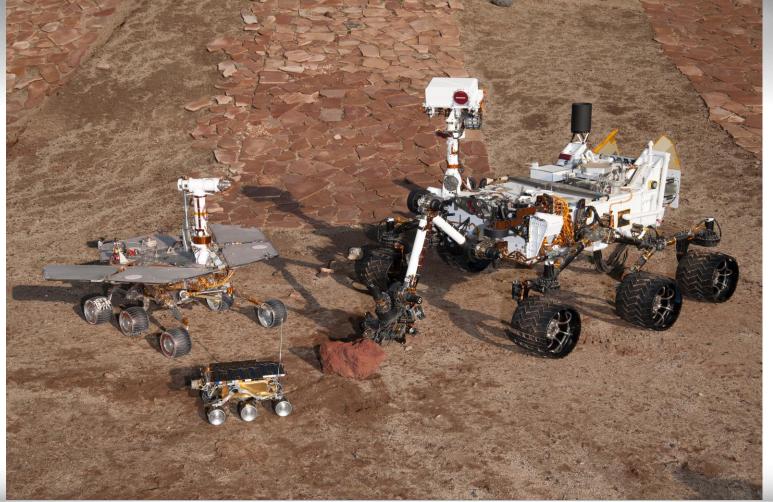
- Antoine de Saint-Exupéry, *Terre des Hommes*, 1939 Author of "*The Little Prince*"















Take pictures with the camera's scan platform providing an unobstructed view of the planet

Power the spacecraft with a hot radioisotope power supply and provide a clear view of cold deep provide a clear view of cold deep space #1

Measure the weak magnetic field with as little influence from the spacecraft as possible

Send as much data back to Earth as possible





UV Spectrometer

Two cameras & a Photopolarimeter

16 tiny thrusters

12 bays of
Electronics
arrayed as a
dodecagon

Plasma wave

Cosmic ray detector

High Gain Antenna

Deployable Magnetometer boom Radioisotope
Thermoelectric
Generator (RTG)

Example #2:

Curiosity's Mars Landing Engines







Example #2: Curiosity's Mars Landing Engines





Throttle Valve



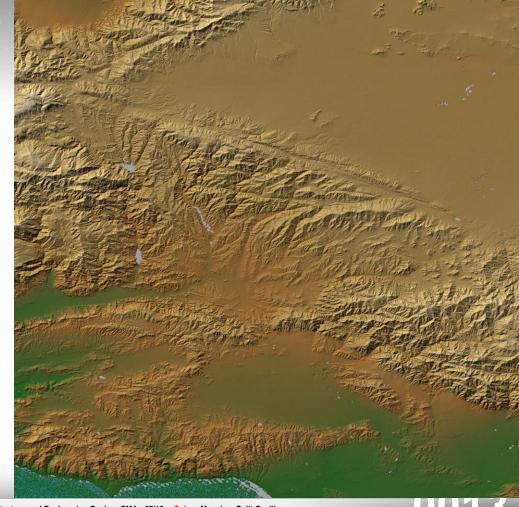
Engine (white hot!)



Example #3:

The Shuttle Radar Topography Mission (SRTM)

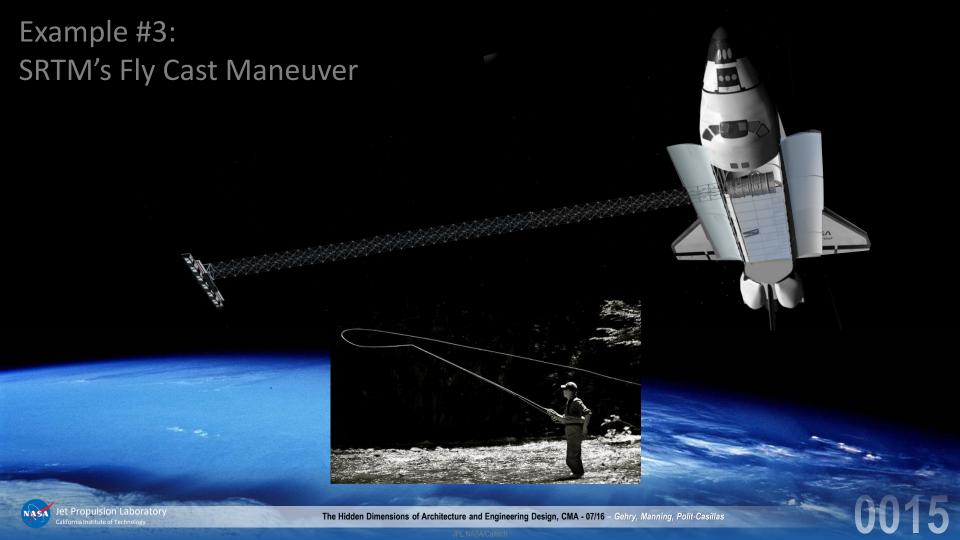
Over 11 days in February 2000, JPL's SRTM created the world's first near-global digital elevation map of planet Earth to a spatial resolution of 30 m.

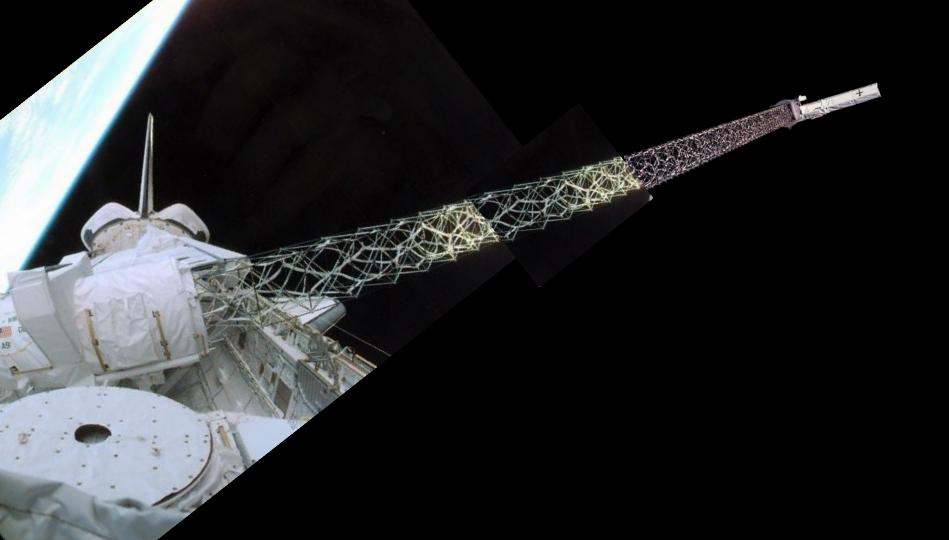


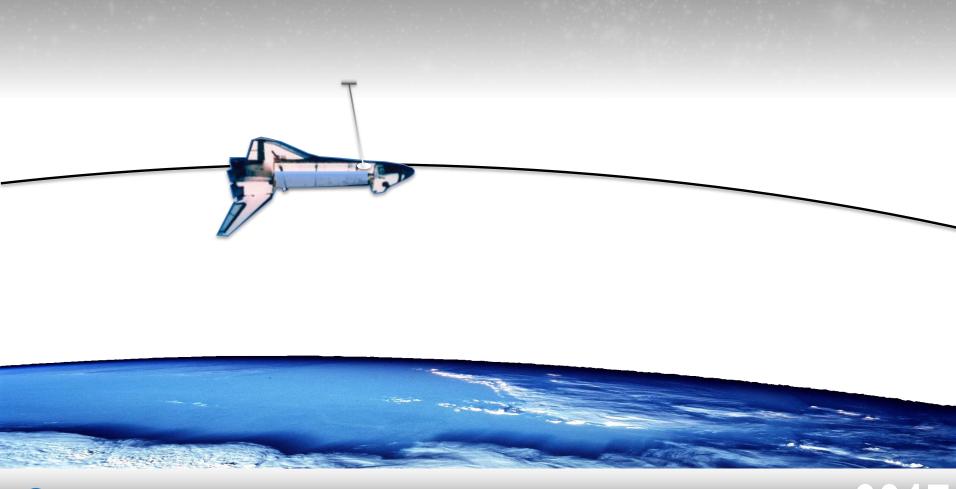




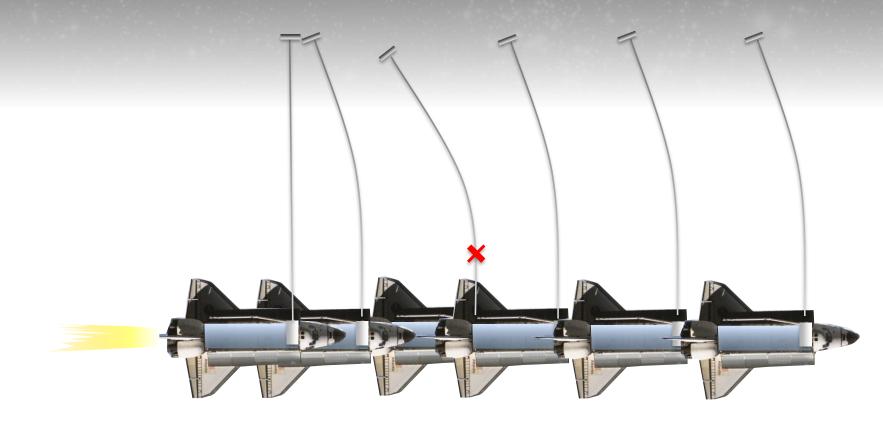




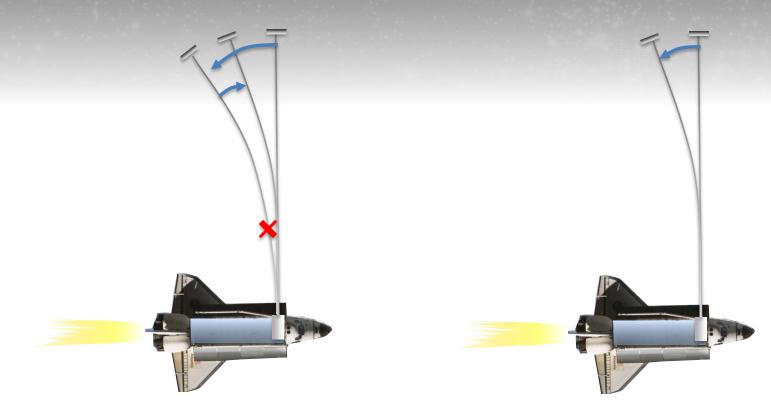












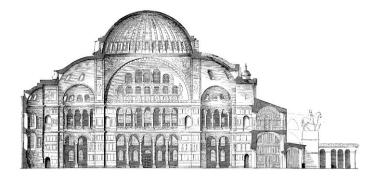


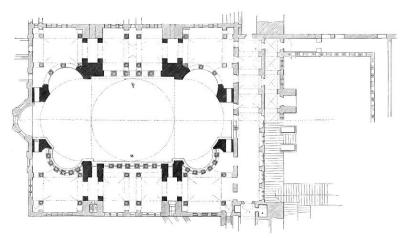


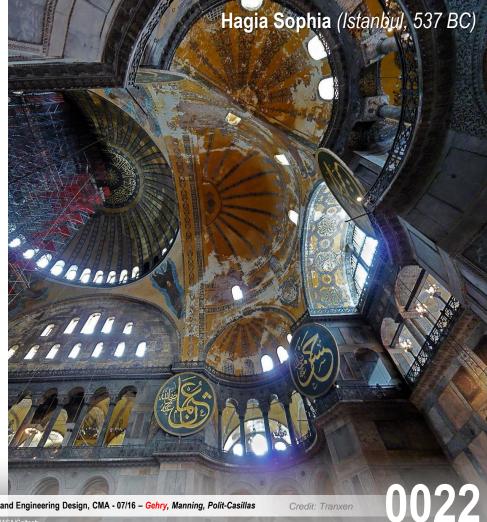
Raul Polit-Casillas

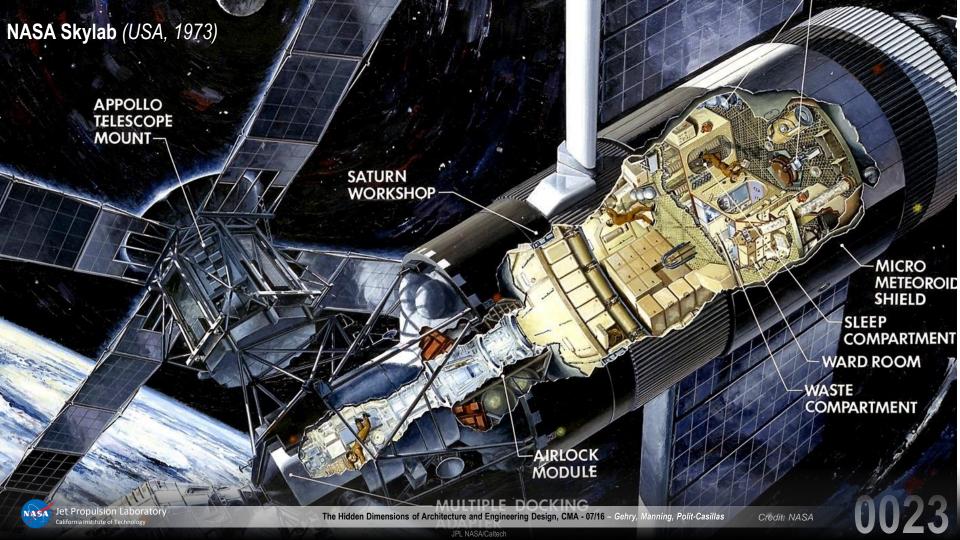














Atelier is a concentrated effort in system-level optimized design and configuration, a concurrent engineering design studio for Advance Concept Development, Technology Infusion and Skill Development

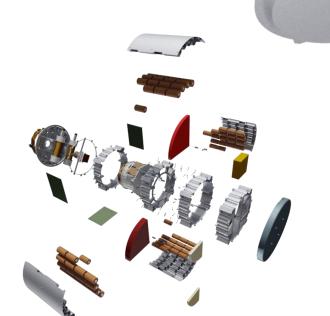
Lew Soloway, Arbi Karapetian, John Ziemer, Raul Polit-Casillas

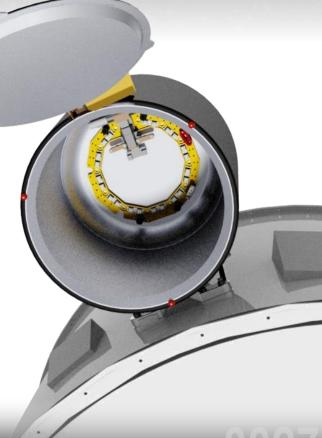




"Artist's Concepts"

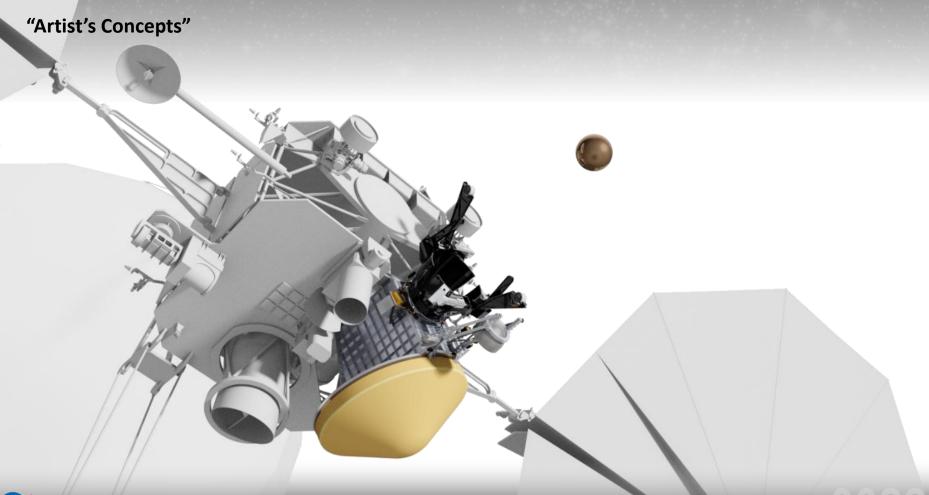






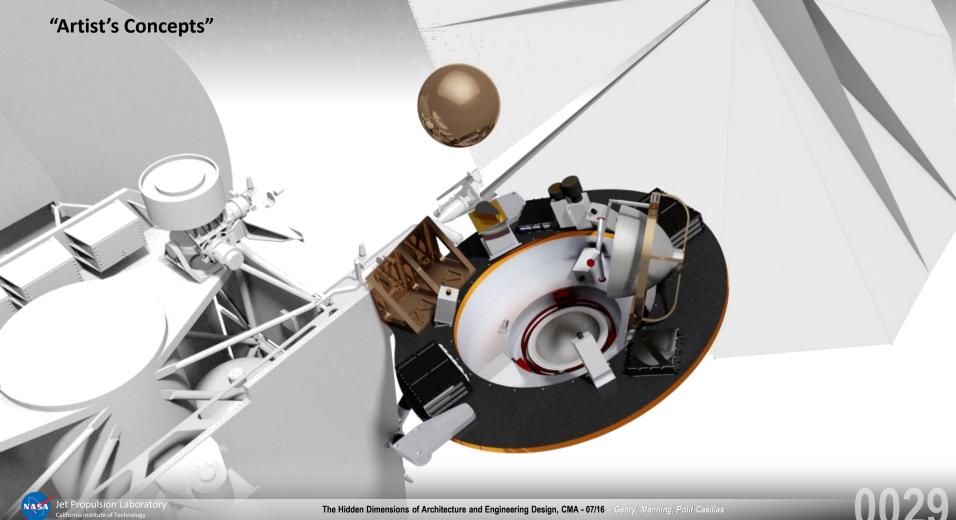


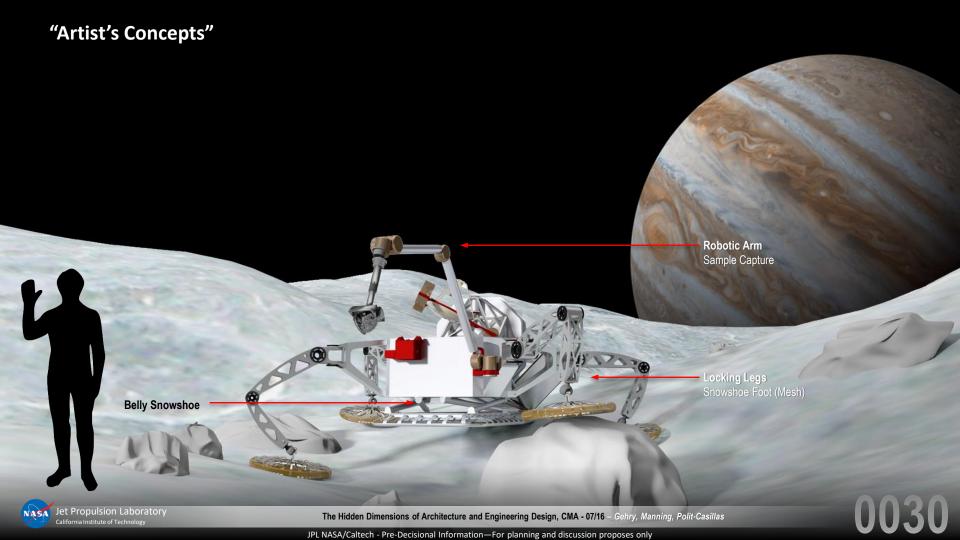


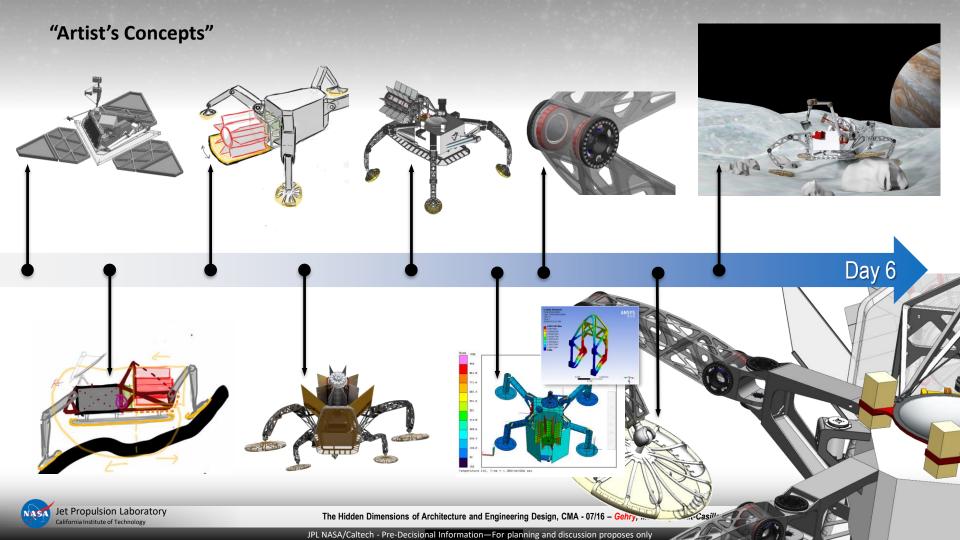




The Hidden Dimensions of Architecture and Engineering Design, CMA - 07/16 – Gehry, Manning, Polit-Casillas









Frank O. Gehry











